

Should the class take a Quiz next Thur 12/6?

Yes

No

Didn't Answer

||| Quiz 5

Key

|||||

|||||

||

Show all your work. No credit is given without reasonable supporting work. There are two sides to this quiz.

1. [3] (§5.2 #69) Given $\frac{\pi}{2} \leq \theta \leq \frac{3\pi}{2}$ and $\sin \theta = -\frac{1}{5}$. Find $\tan \theta$.

$$\tan \theta = \frac{\sin \theta}{\cos \theta} = \frac{-\frac{1}{5}}{-\frac{\sqrt{24}}{5}} = \frac{1}{\sqrt{24}}$$

(1.5)



(1.5) { we need to find $\cos \theta$

Method 1:

(1.5) $\sin^2 \theta + \cos^2 \theta = 1$

(1) $(-\frac{1}{5})^2 + \cos^2 \theta = 1$

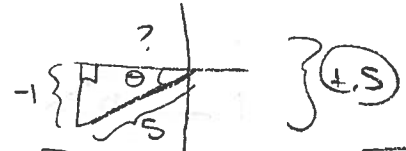
(1) $\cos^2 \theta = 1 - \frac{1}{25} = \frac{24}{25}$

$\cos \theta = \pm \sqrt{\frac{24}{25}}$

(1.5) neg b/c quad 2 or 3

Method 2:

$\sin \theta = \frac{opp}{hyp}$



$?^2 + (-1)^2 = 5^2$

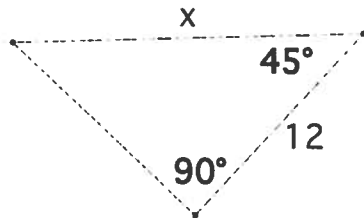
$\Rightarrow ?^2 = 25 - 1 = 24$

$\Rightarrow ? = \sqrt{24}$

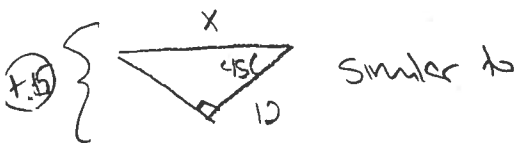
(1) $\cos \theta = \frac{\sqrt{24}}{5}$

(1.5) neg b/c quad 2 or 3

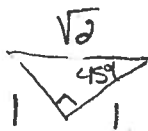
2. [1] (WebHW14 #10) Find the length of the side marked x in the triangle below.



Method 1: Similar Δ



similar to



(1.5) so $\frac{x}{12} = \frac{\sqrt{2}}{1}$

$\Rightarrow x = 12\sqrt{2}$

≈ 16.97

Method 2: trig

Sohcahtoa

(1.5) have a want $x=h$

$\cos 45^\circ = \frac{12}{x}$

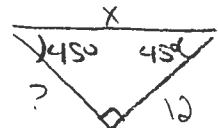
$x = \frac{12}{\cos 45^\circ} = \frac{12}{\frac{1}{\sqrt{2}}}$

(1.5) $\Rightarrow x = 12\sqrt{2}$

1

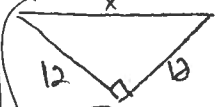
Method 3: geometry

b/c the angles sum to 180



\Rightarrow the Δ is isosceles

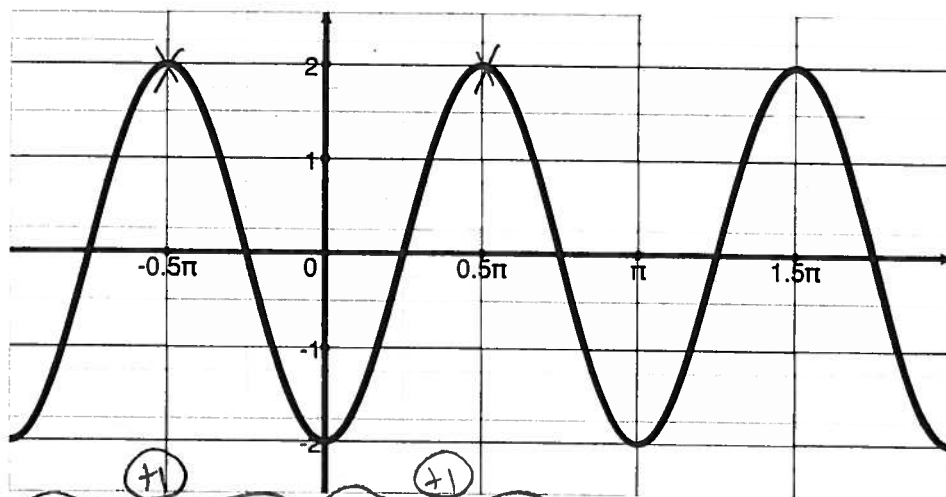
$\Rightarrow ? = 12$



(1.5) by Pyth $12^2 + 12^2 = x^2 \Rightarrow x^2 = 288$
 $\Rightarrow x = 17\sqrt{2}$

3. [3] (WebHW13 #13) Write an equation that represents the curve below in the form:

$$y = a \cos k(x - b) \quad \text{or} \quad a \cos (kx - kb)$$



or
amp = -2
period = π
no phase shift

\Rightarrow
 $-2 \cos(2x)$

(+.5)
amplitude = 2
 $\Rightarrow a = 2$

(+1)
period = π
 $\Rightarrow \frac{2\pi}{k} = \pi$
 $\Rightarrow k = 2$

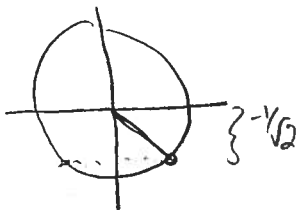
(+1)
phase shift
 $-\frac{\pi}{2} = \frac{-kb}{k} = b$
 $b = +\frac{\pi}{2}$

So
 $y = 2 \cos 2(x + \frac{\pi}{2})$
or $2 \cos(2x + \pi)$
note phase shift could have been $\frac{\pi}{2}$ or $-\frac{\pi}{2}$

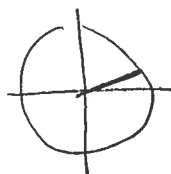
4. [3] (§7.4 #3 & 19) Evaluate the following exactly:

$$\arcsin\left(\frac{-1}{\sqrt{2}}\right)$$

$$-\frac{\pi}{4}$$



$$\sin^{-1}\left(\sin\left(\frac{\pi}{6}\right)\right) = \sin^{-1}\left(\frac{1}{2}\right) = \frac{\pi}{6}$$



using def's (+.5)

angle works (+1)
correct re between $-\frac{\pi}{2} + \frac{\pi}{2}$ (+.5)